



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,669	08/05/2003	Koji Shimazawa	116794	5316

25944 7590 07/26/2005

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/633,669

Applicant(s)

SHIMAZAWA ET AL.

Examiner

Kevin M. Bernatz

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/3/05.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 07222005.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

10/2

DETAILED ACTION

Response to Amendment

1. Amendments to claim 1 and addition of new claims 9 - 11, filed on May 3, 2005, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al. (U.S. Patent App. No. 2002/0051380 A1) in view of Mizuguchi et al. (U.S. Patent No. 6,287,709 B1) for the reasons of record as set forth in Paragraph No. 4 of the Office Action mailed on January 10, 2005.

Regarding the amended limitation of the specific AFM material and thickness, the Examiner notes that Kamiguchi et al. disclose AFM layers meeting applicants' claimed thickness and material limitations (*Paragraph 0125*).

4. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al. in view of Mizuguchi et al. as applied above, and further in view of applicants' admissions.

Kamiguchi et al. and Mizuguchi et al. are relied upon as described above.

Neither of the above explicitly disclose the exchange coupling energy of the films.

However, applicants' admissions teach the importance of insuring a high exchange coupling force in order to improve the reliability of the magnetic head (pages 1 - 3). The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a results effective variable such as the magnitude of J_k through routine experimentation, especially given applicants' admissions regarding the desire to maximize the value of J_k to improve the reliability of the magnetic head. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the Examiner notes that many of the structures admitted by applicants can be used to increase J_k and still fall under the coverage of the claimed AFM thickness limitations (e.g. adding additional ferromagnetic layers for enhancing the exchange coupling, using a FM/non magnetic/FM structure, etc.).

Response to Arguments

5. The rejection of claim 1 under 35 U.S.C § 102(e) - Kamijo

The above noted rejection has been withdrawn in view of applicant(s) arguments, which have been found persuasive. Specifically, applicant(s) argue that the perfected priority claim pre-dates the effective date of Kamijo, which the Examiner agrees is correct.

6. The rejection of claims 1 - 11 under 35 U.S.C § 103(a) – Kamiguchi et al. in view of various references

Applicant(s) argue(s) that “Kamiguchi does not provide any teachings relating to contacting a face-centered cubic structured ferromagnetic layer specifically with the antiferromagnetic layer to increase the exchange-coupling energy” (*pages 6 and 7 of response*), that “Kamiguchi does not disclose or suggest that smaller thicknesses of the antiferromagnetic layer may be used while still obtaining sufficient exchange-coupling energy” (*page 6 of response*), and that “the exchange-coupled film set forth in claim 1 ... provides unexpected results that cannot be derived from the combined Kamiguchi and Mizuguchi references”. The examiner respectfully disagrees.

The Examiner notes that patentability based upon a showing of unexpected results must be commensurate in scope with the showing of unexpected results. In the instant case, applicants data indicates that additional factors impact the exchange-coupling energy other than just the thickness of the AFM layer (e.g. examples 8 and 21 show almost a 40-50% change in J_k based only on the choice of FM materials and thickness values). Specifically the Examiner notes that some “lower limit” of the improved exchange-coupling energy appears to be necessary to distinguish over embodiments where the use of a “thin” AFM layer adjacent to a face-centered cubic ferromagnetic layer results in relatively low values of exchange-coupling energy (e.g. comparative example 2 shows that just having a face-centered cubic ferromagnetic layer adjacent to a disordered AFM does not necessarily result in an increase in the exchange-coupling energy”).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

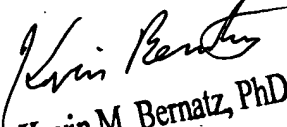
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1773

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
July 22, 2005


Kevin M. Bernatz, PhD
Primary Examiner